REMARKS

In view of the foregoing amendments and the following remarks, reconsideration and allowance are requested.

Claims 6-12 and 14-23 are now pending with claims 6 and 9 being independent. Claims 6-12 have been amended and claims 14-23 are newly presented for consideration. Attached is a marked-up version of the changes being made by the current amendment.

Initially, the Examiner is requested to acknowledge that the two references (US 5818068 (Sasaki) and US 5814835 (Makita)) cited in the IDS filed along with this application have been made of record.

Claim 6 stands rejected under 35 USC 112, second paragraph for the reasons asserted at page 2 of the office action. Without conceding the propriety of this rejection, and solely to expedite prosecution, claim 6 has been amended to address the Examiner's concerns. Claim 6 as presented fully complies with 35 USC 112.

For the reasons asserted at pages 2-4 of the office action, claims 6-12 stand rejected variously under 35 USC 102(b) and 103(a) as being unpatentable over Zhang '937 (USP 5,529,937) either alone or in combination with Ohtani '826 (USP 5,643,826). These rejections and their underlying rationale are traversed.

As presented, independent claim 6 recites a method of manufacturing a semiconductor device that includes, among other things, forming a metal added region having a length that extends beyond an end portion of a crystalline semiconductor island in a longitudinal direction of the metal element added region. An example of such a semiconductor device is disclosed in the specification and drawings at least at page 5, lines 4-5, page 5, line 26 - page 6, line 13, and in Fig. 1A.

The cited art fails to disclose or suggest forming a metal added region as recited in claim 6. The primary citation to Zhang '937 relates to a process for fabricating thin film transistors. As disclosed in Zhang '937 in Figs. 3A - 3E and at col. 13, lines 11-41, nickel film is formed in an area 300 using a mask 303. According to Zhang '937, area 300 "is the one in which nickel is doped directly and contained in high density." Consequently, applicants submit that Zhang '937 fails to disclose or suggest a method of manufacturing a semiconductor device as recited in claim 6 in which a metal added region is formed having a length that extends beyond an end portion of a crystalline semiconductor island in a longitudinal direction of the metal element added region.

Ohtani '826, while cited for a different reason, fails to cure the deficiencies of Zhang '937. That is, Ohtani '826 also

fails to disclose or suggest a method of manufacturing a semiconductor device as recited in claim 6 in which a metal added region is formed having a length that extends beyond an end portion of a crystalline semiconductor island in a longitudinal direction of the metal element added region.

This difference between the method of claim 6 and the art of record results in several advantages, for example, such as discussed at page 6, lines 20-26, and illustrated in Fig. 2A. Accordingly, claim 6 is allowable at least for the foregoing reasons.

Independent claim 9, as presented, recites a semiconductor device manufacturing method that includes, among other things, selectively introducing a metal element capable of promoting crystallization of an amorphous semiconductor film into at least a first region and a second region to form first and second metal element introduced regions, respectively. Claim 9 further recites forming an active region of the semiconductor device in the first crystalline semiconductor region without forming an active region at the second crystalline semiconductor region. An example of such a semiconductor device is disclosed in the specification and drawings at least at page 10, lines 4-7.

The art of record fails to disclose or suggest the combination of features recited in claim 9. Applicants submit

that in Zhang '937 a metal added region is formed in only a single area (nickel-doped area 300) and serves as the region where crystals are grown to form islands 306 and 307. Accordingly, applicants submit that Zhang '937 does not disclose or suggest forming an active region of a semiconductor device in a first crystalline semiconductor region without forming an active region at the second crystalline semiconductor region, as recited in claim 9. To the contrary, Zhang '937 discloses only a single metal added region which is used to form both islands 306 and 307.

Ohtani '826 also fails to disclose or suggest a method of manufacturing a semiconductor device as recited in claim 9 in which an active region of a semiconductor device is formed in a first crystalline semiconductor region without forming an active region at the second crystalline semiconductor region. Accordingly, independent claim 9 is allowable at least for this reason.

Each of the remaining claims depends from one of the independent claims. These dependent claims are allowable at least for the reasons that their respective independent claims are allowable and for reciting allowable subject matter in their own right. Accordingly, independent consideration and allowance of the dependent claims are requested.

For example, new dependent claim 23, which depends from claim 9, recites the additional feature of controlling crystal growth state using the second metal element introduced region. Support for this feature appears in the specification at least at page 10, lines 4-7. Because the art of record fails to disclose or suggest this feature, dependent claim 23 is allowable for this additional reason.

Applicant asks that all claims be allowed. Please apply any charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

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Version with markings to show changes made

In the claims:

Claims 6-12 have been amended as follows:

6. (Amended) A method of manufacturing a semiconductor device, said method comprising [the steps of]:

forming an amorphous [silicon] semiconductor film on [a substrate having] an insulating surface;

introducing a metal element capable of promoting crystallization of the amorphous semiconductor film to form [forming] a metal element added region [where metal elements that promote the crystallization of silicon which is longitudinally shaped is added on said amorphous silicon film];

[and]

[conducting a heat treatment to allow crystal to grow] crystallizing the amorphous semiconductor film to cause crystal growth to proceed in a crystal growth direction parallel to [said substrate] the insulating surface from [said] the metal element added region thereby forming a crystalline semiconductor film;

[wherein said metal element added region extends longitudinally over an end portion of a semiconductor active layer pattern which will be formed in a post-process by a predetermined distance]

patterning the crystalline semiconductor film to form at least a crystalline semiconductor island in which carriers move in a carrier moving direction identical with the crystal growth direction,

wherein the metal element added region is separated from the crystalline semiconductor island by a distance, and

wherein the metal element added region has a length that extends beyond an end portion of the crystalline semiconductor island in a longitudinal direction of the metal element added region.

7. (Amended) A method [of manufacturing a semiconductor device] according to claim 6,

wherein [a distance by which the metal element added region extends longer from an end portion of the active layer] the length of the metal element added region is set to 50% or more of [the] a crystal growth distance.

8. (Amended) A method [of manufacturing a semiconductor device] according to claim 6,

wherein the metal [elements consist of one or plural kinds of elements] element comprises at least one element selected from Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu and Au.

9. (Amended) A method of manufacturing a semiconductor device, said method comprising [the steps of]:

forming an amorphous [silicon] semiconductor film on [a substrate having] an insulating surface;

selectively introducing a metal element[s] [that promote the] capable of promoting crystallization of [silicon] the amorphous semiconductor film into [a plurality of regions] at least a first region and a second region of [said] the amorphous [silicon] semiconductor film to form a first metal element introduced region and a second metal element introduced region, respectively; [and]

[conducting a heat treatment to allow crystal to grow] crystallizing the amorphous semiconductor film to cause crystal growth to proceed in parallel to [said substrate] the insulating surface from [said plurality] each of the first and second metal element introduced regions [into which the metal elements have been selectively introduced] to form a first crystalline semiconductor region and a second crystalline semiconductor region;

[wherein at least one of said regions into which the metal elements have been selectively introduced is not used for formation of an element but provided for controlling crystal

growth states of other regions into which the metal elements have been selectively introduced]

forming at least an active region of the semiconductor device in the first crystalline semiconductor region without forming an active region at the second crystalline semiconductor region.

10. (Amended) A method [of manufacturing a semiconductor device] according to claim 9,

wherein the metal [elements that promote the crystallization of silicon consist of one or plural kinds of elements] element comprises at least one element selected from Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu and Au.

11. (Amended) A method [of manufacturing a semiconductor device] according to claim 9,

wherein [the introduction of] the metal element[s] is [conducted] introduced by an ion implanting method.

12. (Amended) A method [of manufacturing a semiconductor device] according to claim 9,

wherein [the introduction of] the metal element[s], is [conducted] introduced by coating a solvent comprising the metal element [in which metal elements are dissolved or dispersed].